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10/581,648

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EXAMINER

WRIGHT, GIOVANNA COLLINS

ART UNIT

PAPER NUMBER

3672

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/581,648

Applicant(s)

CURLETT, HARRY B.

Examiner

GIOVANNA C. WRIGHT

Art Unit

3672

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period **will** apply and **will** expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply **will**, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-16, 51 and 53 is/are allowed.
- 6) ☒ Claim(s) 1-9, 17-36, 38-44, 46-50, 52 and 54-58 is/are rejected.
- 7) ☒ Claim(s) 37 and 45 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2007 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Drawings***

1. The drawings are objected to because in Figs. 4 and 5, the reference number 69 is used to a well and to the wellhead for well 68.

Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claim 11 is objected to because of the following informalities: In claim 11, line 2, the word "hold" should be changed to - - hole- - . Appropriate correction is required.

Claim 19 is objected to because of the following informalities: The acronym "PJARMMD" should be defined the first time the acronym is used in the claims. Appropriate correction is required.

Claim 54 is objected to because of the following informalities: The acronym "HPJD" should be defined the first time the acronym is used in the claims. Appropriate correction is required.

Claims 39-40 are objected to because of the following informalities: In claims 39-40, it appears that the word "reservoir" should be changed to - - reservoirs- - . Appropriate correction is required.

Claims 47-48 are objected to because of the following informalities: In claims 47-48, it appears that the word "reservoir" should be changed to - - reservoirs- - . Appropriate correction is required.

Claim 56 is objected to because of the following informalities: In claim 56, line 20, the phrase "PJAltMD" should be changed to - - PJARMD- - . Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

2. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 8, page 33, line 1, the applicant recites the phrase "the rate is greater". It is unclear which rate the applicant is referring to since the applicant previously recited "the injection well injects periodically at different injection rates".

Also claim 8 recites the limitation "the continuous production rate" in line 1 on page 33. There is insufficient antecedent basis for this limitation in the claim, as this limitation has not been previously recited.

Claim 25 recites the limitation "the reservoir" in line 25 on page 35. There is insufficient antecedent basis for this limitation in the claim, as this limitation has not been previously recited.

Claim 29 claims there are multiple reservoirs. However, claim 29 depends from claim 28 which claims a single reservoir. It is unclear how many reservoirs are being claimed.

Claim 38 recites the limitations "the injection wells" in line 19 and "the production rate" in line 20 on page 37. There is insufficient antecedent basis for these limitations in the claim, as these limitations have not been previously recited.

Claims 39-40 refer to multiple reservoirs. However, the claims depend from claim 38 which claims a single reservoir. It is unclear whether the applicant intends to claim a single reservoir or multiple reservoirs.

Claim 46 recites the limitations "the injection wells" in line 3 and "the production rate" in line 4 on page 39. There is insufficient antecedent basis for these limitations in the claim, as these limitations have not been previously recited.

Claims 47-48 refer to multiple reservoirs. However, the claims depend from claim 46 which claims a single reservoir. It is unclear whether the applicant intends to claim a single reservoir or multiple reservoirs.

In claim 50, page 39, line 18, the applicant recites the phrase "the rate is greater". It is unclear which rate the applicant is referring to since the applicant previously recited "the injection well injects periodically at different injection rates".

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 4-7, 17 and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by Brown 5685362.

Referring to claim 1 and 52, Brown discloses a method of extracting thermal energy from a rock formation, the method comprising the steps of: drilling a plurality of wells (4) to a depth sufficient to allow development of at least one fracture joint cloud reservoir; hydraulically fracturing at least one of the plurality of wells ( col. 2, lines 45-47); dilating the at least one fracture joint cloud reservoir; forcing cooled water under high pressure and volume into at least one of the plurality of wells to charge the reservoir; alternately opening and closing a plurality of discharge control valves and a plurality of injection control valves to provide continuous flow from the plurality of wells and permit discharge from the reservoir; removing heated water from the wells; and passing the heated water to a heat exchanger ( col. 3, lines 44-64).

Referring to claims 4-6, Brown discloses wherein a volume of the at least one fracture joint cloud reservoir is increased through simultaneous mechanical and thermal cycling and heat values in the at least one fracture joint cloud reservoir are maintained through mechanical and thermal cycling of the reservoir rock and the volume of heat

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that may be swept in the at least one fracture joint cloud reservoir is increased through thermal and mechanically cycling reservoir rock ( col. 4, lines 1-24).

Referring to claim 7, Brown discloses the step of charging and discharging of the system is further includes the step of timing the charging and discharging to produce a sequence of cycles with steady state load following production cycles generated while still inducing coincidental thermal mechanical cycling that results in brecciation and spallation of the reservoir rock ( col. 7, lines 33-53).

Referring to claim 17, Brown discloses dilating a plurality of material join in the formation (col. 2, lines 45-47).

5. Claim 58 is rejected under 35 U.S.C. 102(b) as being anticipated by Greene 3975912.

Referring to claim 58, Greene discloses a method of processing chemical reactions utilizing a reactor vessel (81) immersed in a geothermal production well ( at 80) in order to allow the geothermal heat energy to initiate, sustain and/or support the conditions (see abstract).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:



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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown '362 in view of Goodwin et al. 3375886.

Referring to claims 2-3, Brown does not disclose hydraulic drilling but does disclose the well is located in rock. Goodwin teaches particle jet drilling is very effective in drilling holes through rock without producing a lot of wear on the bit ( col. 1, lines 69-col. 2, line 4). As it would be advantageous to have a type of drilling that does not wear out the bit easily, it would be obvious to one of ordinary skill in the art to modify the method disclosed by Brown to use Particle jet drilling in view of the teachings of Goodwin.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brown '362 in view of the Applicant's cited prior art.

Referring to claim 9, the Brown reference does not disclose at least three wells. The Applicant's cited prior art in Fig 2 and in specification ( page, 5, lines 1-7 and pages 13, lines 26-28) discloses that it is well known in the art to have at least three wells. As it would be advantageous to have additional wells to extract as much heat as possible, it would be obvious to one of ordinary skill in the art at the time of the invention to modify the method disclosed by Brown to have at least three wells in view of the Applicant's cited prior art.

9. Claims 18-19 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Brown'362 in view of Cleary '031.

Referring to claims 18-19, Brown does not disclose the drilling an upper well portion with a rotary mechanical drill bit. Cleary teaches that a rotary bit that has PJARMD methodology produced a single borehole with greater speed and efficiency ( col. 1, lines 42-45). As it would be advantageous to drill the borehole quickly and efficiently, it would be obvious to one of ordinary skill in the art at the time of the invention to modify the method disclosed by Brown to use the rotary bit using PRARMD methodology in view of the teachings of Cleary.

10. Claims 20-28,30-36,38,41-44,46,49,54-57 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Brown'362 in view of Cleary '031 and Foster 4200152.

Referring to claims 20-21,25-28,30-32,36,38,41-44,46,49, 54, and 56-57, Brown discloses a method of developing deep geothermal reservoirs comprising drilling boreholes (4) so thermal energy is exposed and dilating a group of joints by fracturing (col. 2, lines 45-47) to form a single reservoir and alternate charging and discharging the joints to cause fluid to pass into and out of the reservoir, imparting multiple stress reversal to continuously expose new reservoir rock surface ( col. 3, lines 44-64). Brown does not disclose using two drilling methods. Foster teaches there is sediment about a hot crystalline rock (see fig. 1). Cleary reaches using a PJARMD drilling method and a particle jet drilling for drilling through different kinds of formations that can be encountered ( col. 1, lines 47-56). As it would be advantageous to use the best drilling

method for the formation encountered, it would be obvious to one of ordinary skill in the art to modify the method disclosed by Brown to use the rotary drilling method through the softer sediment and the particle jet drilling through the harder rock in view of the teachings of Cleary and Foster.

Referring to claims 22-24,33-35 and 55, Cleary discloses the particle jet drilling methodology includes the process of entraining discrete high density solid particles in a drilling fluid for cutting the formation and the formation cutting uses impulse energy imparted to the formation by momentum transmitted to the entrained particles by the jetting fluid in order to abrade and crack the formation and further including removing the abraded formation at a rapid rate through the flow of fluid therearound ( col. 1., lines 66-col. 2, line 7).

***Allowable Subject Matter***

11. Claims 10-16,51 and 53 are allowed.
12. Claims 37,45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
13. Claims 8,29,39-40,47-48 and 50 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GIOVANNA C. WRIGHT whose telephone number is (571)272-7027. The examiner can normally be reached on 7:30-4 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David J. Bagnell can be reached on 571-272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Giovanna C. Wright/  
Primary Examiner, Art Unit 3672